IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of
Dietrich KLINGLER et al.
Corres. to PCT/EP2004/012717
For: NOZZLE ARRAY, ESPECIALLY FOR A MOTOR VEHICLE

VERIFICATION OF TRANSLATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Charles Edward SITCH BA,

Deputy Managing Director of RWS Group Ltd UK Translation Division, of Europa House, Marsham Way, Gerrards Cross, Buckinghamshire, England declare:

That the translator responsible for the attached translation is familiar with both the German and the English language, and that, to the best of RWS Group Ltd knowledge and belief, the attached English translation of International Application No. PCT/EP2004/012717 is a true, faithful and exact translation of the corresponding German language paper.

I further declare that all the statements made in this declaration of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of legal decisions of any nature based on them.

May 2, 2006

Date

Name: Charles Edward SITCH

For and on behalf of RWS Group Ltd

BEHR GmbH & Co. KG
Mauserstraße 3, 70469 Stuttgart

Nozzle array, especially for a motor vehicle

The invention relates to a nozzle array, especially for a motor vehicle, according to the preamble to claim 1.

From EP 1 223 061 A2, an air discharger, especially for vehicle air conditioning purposes, is, comprising a frame, a plurality of blades, which are disposed pivotably about a first axis, and at least one coupling element, to which each of the blades is coupled, the coupling element being adjustable relative to the first axis between a neutral setting in which the blades are parallel to one another and a comfort setting in which at least part of the blades are pivotable in a mutually opposite direction. The air discharger is disposed in front of an air duct from which there issues an air current, the direction of which can be adjusted with the aid of the air discharger. The air current can here be fanned out with the aid of the counter-pivoted blades, thereby producing a divergent air current in which lower flow velocities prevail than in an air current of constant cross section, so that, even at a high air flow rate, the issuing air current can be prevented from hitting an occupant of the vehicle at high speeds. Such an air discharger still leaves something to be desired, however, especially with regard to the visual appearance.

The object of the invention is to provide an improved nozzle array.

This object is achieved by a nozzle array having the features of claim 1. Advantageous embodiments are the subject of the subclaims.

According to the invention, a nozzle array, especially for a ventilation system of a motor vehicle, is provided, comprising at least one nozzle disposed at one end of a flow duct and a grille disposed at the nozzle outlet, the grille partially, preferably in the central region, concealing the nozzle outlet, so that a gap, especially a gap running around the grille, remains unconcealed. Especially in the case of a purely diffuse air flow, this gap serves for the discharge of air, thereby helping to distribute the air, while a directed air jet can penetrate the grille without difficulty. The grille serves, in particular, as a visual screen, so that the nozzles inside, under normal circumstances, is not or is only barely apparent to a passenger.

Preferably, the grille is rectangular in configuration. In the case of a single nozzle, the grille can then be substantially square in configuration; if two nozzles are disposed side by side, then the grille conceals the central region of both nozzles. The grille in question is preferably a mesh-like grille, which, in particular, is dark, preferably black.

As the nozzle, a swirl nozzle is preferably used, which offers advantages, in particular, when the flow is diffuse.

The invention is explained in detail below on the basis of an illustrative embodiment with reference to the drawing, in which:

fig. 1 shows a perspective view of a nozzle array according to the illustrative embodiment, the arrows indicating a directed air flow,

fig. 2 shows a section through the nozzle array of fig. 1, the arrows indicating a directed air flow,

fig. 3 shows a perspective view of the nozzle array of fig. 1, the arrows indicating a mixed air flow,

fig. 4 shows a section through the nozzle array of fig. 1, the arrows indicating a mixed air flow,

fig. 5 shows a perspective view of the nozzle array of fig. 1, the arrows indicating a diffuse air flow, and

fig. 6 shows a section through the nozzle array of fig. 1, the arrows indicating a diffuse air flow.

The figures show an adjustable nozzle 1, in the present case a swirl nozzle, which is used in an air discharger of a ventilation system of a motor vehicle. At the end of two adjacent, mutually assigned nozzles 1, hereinafter also referred to as the nozzle outlet, there is disposed a grille 2, integrated in a cover plate, which grille, on the one hand, protects the nozzles 1 and, on the other hand, makes the design more appealing. The grille 2 is here configured such that it conceals the central region of the nozzle outlet, for which purpose it is substantially nontransparent but air-permeable in configuration, yet has a circumferential gap 3. The adjustable nozzles 1 and the grille 2, inclusive of the gap 3, here form a nozzle array 4 according to the invention. In each of figures

1, 3 and 5, two nozzle arrays 4 are represented side by side, as are used, for example in the middle of the dashboard of a motor vehicle.

Each nozzle 1 is supplied, via a flow duct, with temperature-controlled air from an air conditioning system (not represented). This flow duct is divided in the inlet region of each nozzle 1 into two part flow ducts, namely an outer part flow duct 5 and an inner part flow duct 6. The outer part flow duct 5 is here given a swirl by appropriate deviation in the flow path, so that, through this outer part flow duct 5, the vehicle interior is fed air with a diffuse flow path. By contrast, the inner part flow duct 6 is configured as straight as possible, so that, through this part flow duct 6, the vehicle interior is fed air with a relatively uniform, turbulence-free flow.

The outer part flow duct 5 serves, in particular, to supply air in a comfort setting (diffuse flow) to the nozzle array 1 and is rigidly configured, while the inner part flow duct 6 serves to supply the air in a spot setting (directed flow) of the nozzle array 1. Selective mixed settings are possible. The air current supplied through the flow duct is apportioned to the two part flow ducts 5 and 6 by means of a metering device (not represented in greater detail).

If the nozzles 1 are in a spot setting (figures 1 and 2), i.e. a directed air jet is desired, then only air makes its way through the inner part flow duct 6, which air impacts in a swirl-free manner directly upon the central region of the grille 2 and flows through this substantially without diversion. The direction of the air jet can here be adjusted.

If a mixed air flow, i.e. a partially directed and partially diffuse air flow, is desired, as represented in figures 3 and 4, then - in accordance with the

desired air discharge - the air is distributed to the outer part flow duct 5 and the inner part flow duct 6, whereby the air jet coming through the inner part flow duct 6 is fanned out by the turbulated air jet flowing through the outer part flow duct 5, so that a fanned-out part air jet is discharged through the grille 2 and a diffuse part air jet through the gap 3.

If only diffuse air is intended to be discharged, then only air makes its way through the outer part flow duct 5, which air, provided with a swirl, makes its way to the nozzle outlet and is discharged, in particular, through the gap 3, whereupon it spreads as far as possible, as indicated by arrows in figures 5 and 6.

Reference symbol list

1	nozzle
2	grille
3	gap
4	nozzle array
5	outer part flow duct
6	inner part flow duct